



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,031	01/06/2004	Yuriy V. Mikhaylik	57519.00116	5565

23619 7590 08/01/2007

SQUIRE SANDERS & DEMPSEY LLP
TWO RENAISSANCE SQUARE, 40 NORTH CENTRAL AVENUE
SUITE 2700
PHOENIX, AZ 85004-4498

EXAMINER

WEINER, LAURA S

ART UNIT	PAPER NUMBER
----------	--------------

1745

MAIL DATE	DELIVERY MODE
-----------	---------------

08/01/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/753,031	Applicant(s) MIKHAYLIK, YURIY V.	
	Examiner Laura S. Weiner	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 11, 13 and 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 14-23, 25, 26 and 28-35 is/are rejected.
- 7) ☒ Claim(s) 12 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) ,
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse claims 1-10, 12, 14-26, 28-35 of an electrolyte comprising cyclic ethers and inorganic nitrites in the reply filed on 2-5-07 is acknowledged. The traversal is on the ground(s) that there would not be a burden to search all the species. This is not found persuasive because there are a huge number of species to search for and by picking an elected species it allows for a better search. The requirement is still deemed proper and is therefore made FINAL.

The next species searched was where the N-O additive is an organic nitro compound.

2. Claims 11, 13, 27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 2-5-07.

Terminal Disclaimer

3. The terminal disclaimer filed on 6-22-07 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 10/752,876 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

4. Applicant's arguments with respect to claims 1-10, 14-23, 25-26, 28-35 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

5. Claims 16-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 16-19 are rejected because it is unclear what is meant by "m" in the claims. It is unclear how a concentration can be measured in meters.

Claim Rejections - 35 USC § 103

6. Claims 1-10, 14-15, 20-23, 25-26, 28-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al. (US 2002/0192557).

Choi et al. teaches on page 5, Example 1, a battery comprising an anode comprising lithium metal, a cathode comprising sulfur and an electrolyte comprising 1M **LiSO₃CF₃** and a solvent comprising 1,3-dioxolane/diglyme/sulfolane/dimethoxy ethane. Choi et al. teaches on page 5, [0054], that the organic solvent for the electrolyte can be **dioxolane**, sulfolane, **tetrahydrofuran**, **dimethoxyethane**, **nitromethane** [*organic nitro compound additive, claim 5*], etc. Choi et al. teaches on page 2, [0029], that the lithium-sulfur battery comprises a case comprising a positive electrode, a negative electrode

Art Unit: 1745

and a separator.

Choi et al. teaches the claimed invention teaching that the electrolyte comprises a LiSO_3CF_3 salt and an solvent comprising cyclic ethers tetrahydrofuran and dioxolane or dioxolane and dimethoxyethane or dioxolane and sulfolane but does not specifically teach including nitromethane.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the electrolyte 1,3-dioxolane/diglyme/sulfolane/dimethoxy ethane or any combination thereof and include nitromethane in the electrolyte taught by Choi et al. because it is prima facie obvious to combine two compositions each of which is taught by prior art to be useful for the same purpose in order to form a third composition that is to be used for the very same purpose. See *In re Kerkhoven*, 205 USPQ 1069; *In re Susi*, 169 USPQ 423.

Since Choi et al. teaches the same cell comprising a cathode comprising an electroactive-sulfur-containing material, an anode comprising lithium and a nonaqueous electrolyte comprising one or more solvents selected from acyclic ethers, cyclic ethers, polyethers and sulfones and at least one or more N-O additives then inherently the same cell exhibiting utilization of the electroactive sulfur-containing material of at least 60% and a charge-discharge efficiency of at least 80% over at least 10 cycles at a charge rate of about 0.2 mA/cm² and a discharge rate of about 0.4 mA/cm² must also be obtained.

In addition, the presently claimed property of cell exhibiting utilization of the electroactive sulfur-containing material of at least 60% and a charge-discharge

Art Unit: 1745

efficiency of at least 80% over at least 10 cycles at a charge rate of about 0.2 mA/cm² and a discharge rate of about 0.4 mA/cm² would have obviously have been present once Choi et al. product is provided. *In re Best*, 195 USPQ 433 (CCPA 1977).

Allowable Subject Matter

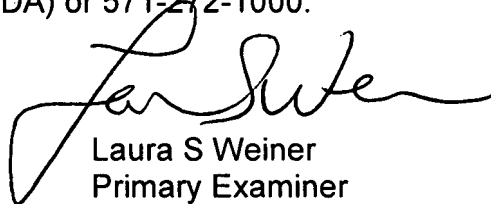
7. Claims 12 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura S. Weiner whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Laura S Weiner
Primary Examiner
Art Unit 1745

July 30, 2007